

Series LRH/2

Code no.

Roll No

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Candidates must write the code on the title page of the answer –book.

- Please check that this question paper contains 12 printed pages.
- Code number given on the right hand side of the question paper should be written on the title this question paper contains 18 questions.
- Please write down the serial Number of the question before attempting it.
- 15 minutwe time has been allotted to read this question paper. The question paper will be distributed at 10.15 a .m from 10.15 am to 10.30 am , the student will read the question paper only and will not write any answer on the answer script during this period.

MATHEMATICS

Time allowed: 3 hours

MaximumMarks:80

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper consists of 30 questions divided into four sections – A,B,C and D Section A comprises of ten questions of 1mark each , Section B comprises of five questions of 2 marks each, section C comprises of ten questions of 3marks each and Section D comprises of five questions of 6 marks each.
- (iii) All questions in section A are to be answered in one word, one sentence or as per the exact requirement of the question.

Section A

Question Numbers 1 to 10 carry 1 mark each.

1. Has the rational number $\frac{441}{2^2 \cdot 5^7 \cdot 7^2}$ a terminating or a non-terminating Decimal representation?
2. If α, β are the zeroes of a polynomial, such that $\alpha + \beta = 6$ and $\alpha\beta = 4$, then Write the polynomial.
3. If the sum of first P terms of an A.P is $\alpha p^2 + \beta p$, find its common difference.
4. In fig. 1, S and T are points on the sides P Q and PR, respectively of ΔPQR , such that $PT = 2$ cm, $TR = 4$ cm and ST is parallel to QR , find the ratio of the areas of ΔPST and ΔPQR .

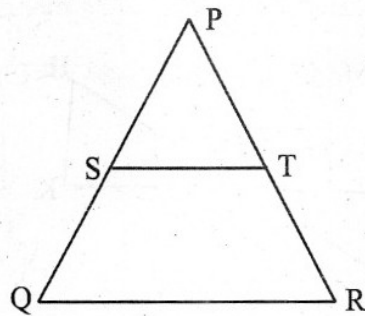


Fig. 1

5. In fig. 2, ΔAHK is similar to ΔABC . If $AK = 10$ cm, $BC = 3.5$ cm and $HK = 7$ cm, find AC .

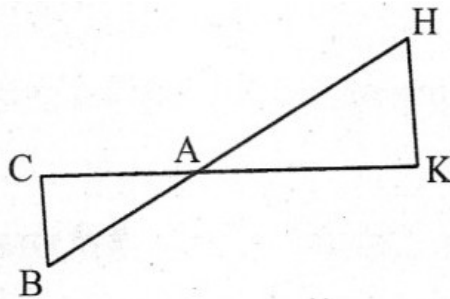


Fig. 2

6. If $3x = \operatorname{cosec} \theta$ and $\frac{3}{x} = \cot \theta$, find the value of $3 \left(x^2 - \frac{1}{x^2} \right)$.
7. if $P(2, p)$ is the mid-point of the line segment joining the points $A(6, -5)$

And B (-2, 11), find the value of p.

8. If A(1,2), B(4,3) and C(6,6) are the three vertices of a parallelogram ABCD, Find the coordinates of the fourth vertex D.
9. The slant height of a frustum of a cone is 4 cm and the perimeters (circumferences) Of its circular ends are 18 cm and 6 cm. find the curved surface area of the frustum.
[Use $\pi = \frac{22}{7}$]
10. A card is drawn at random from a well shuffled pack of 52 playing cards. Find the probability of getting a red face card.

Section B

Question Numbers 11 to 15 carry 2 marks each.

11. if two zeroes of the polynomial $x^3 - 4x^2 - 3x + 12$ are $\sqrt{3}$ and $-\sqrt{3}$, then find its third Zero.
12. Find the value of k for which the following pair of linear equations have Infinitely many solutions:
 $2x + 3y = 7$; $(k-1)x + (k+2)y = 3k$.
13. In an A.P., the first term is 2, the last term is 29 and sum of the terms is 155. Find the common difference of the A.P.
14. if all the sides of a parallelogram touch a circle, show that the parallelogram is a rhombus.
15. Without using trigonometric tables, find the value of the following expression :

$$\frac{\sec(90^\circ - \theta) \cdot \operatorname{cosec} \theta - \tan(90^\circ - \theta) \cot \theta + \cos^2 25^\circ + \cos^2 65^\circ}{3 \tan 27^\circ \cdot \tan 63^\circ}$$

Or

Find the value of $\operatorname{cosec} 30^\circ$, geometrically.

Section C

Question Numbers 16 to 25 carry 3 marks each.

16. Prove that $2 - 3\sqrt{5}$ is an irrational number.
17. The sum of numerator and denominator of a fraction is 3 less than twice the denominator. If each of the numerator and denominator is decreased by 1, the fraction becomes $\frac{1}{2}$ find the fraction.

Or

Solve the following pair of, equations:

$$\frac{4}{x} + 3y = 8; \quad \frac{6}{x} - 4y = -5$$

18. In an A. P. , the sum of first ten terms is -150 and the sum of its next ten terms is -550 . find the A.P.
19. In fig. 3, ABC is a right triangle, right angled at C and D is the mid – point of BC. Prove the $AB^2 = 4 AD^2 - 3AC^2$.

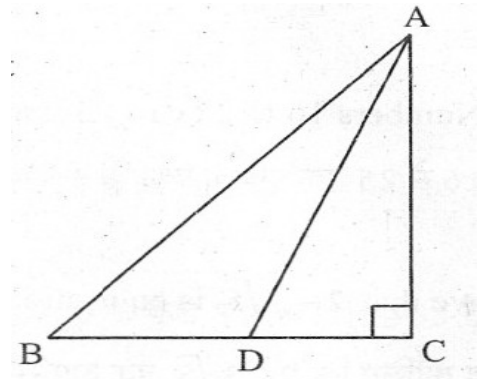


Fig. 3

20. prove the following :

$$\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = 1 + \tan A + \cot A$$

Or

Prove the following :

$$\frac{1}{\tan A + \cot A}$$

$$(\operatorname{cosec} A - \sin A) (\sec A - \cos A) =$$

21. Construct a triangle ABC in which BC = 8 cm, $\angle B = 45^\circ$ and $\angle C = 30^\circ$
construct another triangle similar to $\triangle ABC$ such that its sides are $\frac{3}{4}$ of
the corresponding sides of $\triangle ABC$.
22. Point p divides the line segment joining the points A(2,1) and B(5,-8)
such that $AP/AB = 1/3$, if P lies on the line $2x - y + k = 0$, find the value
of k.
23. If R(x,y) is a point on the line segment joining the point P(α ,b) and Q
(b, α), then prove that $x + y = \alpha + b$.
24. in fig. 4, the boundary of shaded region consists of four semicircular
arcs, two smallest being equal. If diameter of the largest is 14 cm and
that of the smallest is 3.5 cm, calculate the area of the shaded region.

$$\left[\text{Use } \pi = \frac{22}{7} \right]$$

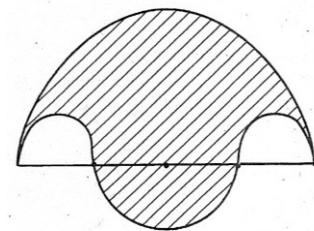


Fig. 4

or

find the area of the shaded region in Fig. 5, if AC = 24 cm, BC = 10 cm
and O is the center of the circle.

[Use $\pi = 3.14$]

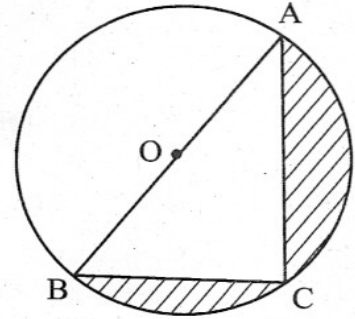


Fig. 5

25. Cards bearing numbers 1,2,3 , ----,35 are kept in a bag. A card is drawn at random from the bag. Find the probability of getting a card bearing
- a prime number less than 15.
 - A number divisible by 3 and 5.

Section D

Question Numbers 26 to 30 carry 6 marks each.

26. Three consecutive positive integers such that the sum of the square of the first and the product the product of the other two is 46, find the integers.

Or

The difference of squares of two numbers is 88. if the larger number is 5 less than twice the smaller number, then find the two numbers.

27. prove that ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

Using the above, prove the following:

If the areas of two similar triangles are equal, then prove that the triangles are congruent.

28. From the top of a 7m high building, the angle of elevation of the top of a tower is 60° and the angle of depression of the foot of the tower is 30° . Find the height of the tower.

29. A mild container is made of metal sheet in the shape of shape of frustum of a cone whose volume is $10459 \frac{3}{7} \text{ cm}^3$. The radii of its lower and upper circular ends are 8 cm and 20 cm respectively. Find the cost of metal sheet used in making the container at the rate of Rs. 1.40 per square centimeter.

$$\left[\text{Use } \pi = \frac{22}{7} \right]$$

Or

A toy is in the form of a hemisphere surmounted by a right circular cone of the same base radius as that of the hemisphere. If the radius of Base of the cone is 21 cm and its volume is $\frac{2}{3}$ of the volume of the hemisphere, calculate the height of the cone and the surface area of the toy.

$$\left[\text{Use } \pi = \frac{22}{7} \right]$$

30. Find the mean, mode and median of the following frequency distribution :

Class :	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency :	4	4	7	10	12	8	5